



UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A ++' GRADE' UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section

Email: academicsectionju14@gmail.com

NOTIFICATION (25/Sept/Adp./77)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the revised Syllabi and Courses of Studies of the subject of **Zoology** of Semester I, II and III for **Four Year Under Graduate Programme (FYUGP)** as per **NEP-2020 (as given in the annexure)** for the **Regular Candidates** for the examinations to be held in the years as per the details given below:-

Subject	Semester	Code Course	New Code Course	For the examinations to be held in the year	%age Change
Zoology	Semester-I	UMJZOT-101	UMJZOT-101	Dec. 2025, 2026 and 2027	20%
		UMIZOT-102	UMIZOT-102	Dec. 2025, 2026 and 2027	20%
		UMDZOT-103	UMDZOT-106	Dec. 2025, 2026 and 2027	100%
		USEZOT-104	USEZOT-111	Dec. 2025, 2026 and 2027	100%
	Semester-II	UMJZOT-201	UMJZOT-201	May 2026, 2027 and 2028	20%
		UMIZOT-202	UMIZOT-202	May 2026, 2027 and 2028	20%
		UMDZOT-203	UMDZOT-203	May 2026, 2027 and 2028	15%
		USEZOT-204	USEZOT-211	May 2026, 2027 and 2028	100%
	Semester-III	UMJZOT301	UMJZOT301	Dec. 2026, 2027 and 2028	15%
		UMJZOT302	UMJZOT302	Dec. 2026, 2027 and 2028	15%
		UMIZOT303	UMIZOT303	Dec. 2026, 2027 and 2028	15%
		UMDZOT304	UMDZOT304	Dec. 2026, 2027 and 2028	15%
USEZOT305		USEZOT311	Dec. 2026, 2027 and 2028	100%	

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/25/ 9637-47

Dated: 10/9/25

Copy for information and necessary action to:

1. Dean, Faculty of Life- Sciences
2. HOD/Convener, Board of Studies in Zoology
3. All members of the Board of Studies
4. Sr. P.A. to the Controller of Examinations
5. Director, Centre for IT Enabled services and Management, University of Jammu for information and for uploading on University Website.
6. C.A. to the Controller of Examinations
7. Director, Computer Centre, University of Jammu.
8. Joint Registrar/Deputy Registrar/Asst. Registrar (Conf./Exam UG/Exam. Non Prof.)

Bhuca
Joint Registrar (Academic)

10/9/25

Department of Zoology
University of Jammu
Course Scheme of Syllabus
Bachelor of Zoology (General/Honors/Honors with Research
As per the Guidelines of National Education Policy-2020)

SEMESTER-I

S No	Course Type	Course No.	Course Title	%age Change	Credits	Marks				Totalmarks
						Theory		Practical		
						Mid Semester	End Exam	Continuous Assessment	Exam	
1.	Major	UMJZOT101	Biomolecules & Physiology of life sustaining systems	20%	4(3T+1P)	15	60	10	15	100
2.	Minor	UMIZOT102	Basics of Biochemistry& Physiology-I	20%	4(3T+1P)	15	60	10	15	100
3.	MDC	UMDZOT106	Applied Zoology	Newly introduced	3	15	60	NA	NA	75
4.	SEC	USEZOT111	Basics in Clinical Biochemistry	100%	3	25 (T+P)	25	NA	25	75

SEMESTER-II

S No	Course Type	Course No.	Course Title	%age Change	Credits	Marks				Total marks
						Theory		Practical		
						Mid Semester	End Exam	Continuous Assessment	Exam	
1.	Major	UMJZOT201	Basics in Cell Biology	20%	4(3T+1P)	15	60	10	15	100
2.	Minor	UMIZOT202	Cytology	20%	4(3T+1P)	15	60	10	15	100
3.	MDC	UMDZOT203	Applied Zoology	15%	3	15	60	NA	NA	75
4.	SEC	USEZOT211	Essentials of Medical Parasitology	100%	3	25 (T+P)	25	NA	25	75



Department of Zoology
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Course Scheme of Syllabus
Bachelor of Zoology (General/Honors/Honors with Research
As per the Guidelines of National Education Policy-2020)

SEMESTER-III

S No	Course Type	Course No.	Course Title	% age Change	Credits	Marks				Total marks
						Theory		Practical		
						Mid Semester	End Exam	Continuous Assessment	Exam	
1.	Major	UMJZOT301	Evolutionary Biology	15%	4(3T+1P)	15	60	10	15	100
2.	Major	UMJZOT302	Environmental Biology	15%	4(3T+1P)	15	60	10	15	100
3.	Minor	UMIZOT303	Ecology and Environment	15%	4(3T+1P)	15	60	10	15	100
3.	MDC	UMDZOT304	Applied Zoology	15%	3	15	60	NA	NA	75
4.	SEC	USEZOT311	Essential Medical Genetics	100%	3	25 (T+P)	25	NA	25	75



University of Jammu
Syllabi of Zoology for FYUGP under CBCS as per NEP-2020

SEMESTER-I

(Examination to be held in December 2025, 2026, 2027)

Major Course

Course Code: UMJZOT101

Course Title: Biomolecules and Physiology of
Life sustaining systems

Credits: 04{03(Theory)+01(Practical)}

Total no. of lectures: Theory: 45hours
Practical: 30hours

MaximumMarks:100
Theory: 75
Practical/Tutorial: 25

Minor Course

Course Code: UMIZOT102

Course Title: Basics of Biochemistry and
Physiology-1

Credits: 04{03(Theory)+01(Practical)}

Total no. of lectures: Theory:45hours
Practical: 30hours

Maximum Marks: 100
Theory: 75
Practical/Tutorial: 25

Multidisciplinary Course

Course Code: UMDZOT106

Course Title: Applied Zoology

Credits: 03

Total no. of lectures: Theory: 45hours

Maximum Marks: 75
Theory: 75

Skill Enhancement Course

Course Code: USEZOT111

Course Title: Basics in Clinical Biochemistry

Credits: 03

Total no. of lectures: Theory/Practical:75hours
(15 hours)/(60 hours)

Maximum Marks: 75



University of Jammu

Syllabi of Zoology for FYUGP under CBCS as per NEP-2020

SEMESTER-II

(Examination to be held in May 2026, 2027, 2028)

Major Course

Course Code: UMJZOT201

Course Title: Basics in Cell biology

Credits: 04{03(Theory)+01(Practical)}

Total no. of lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Minor Course

Course Code: UMIZOT202

Course Title: Cytology

Credits: 04{03(Theory)+01(Practical)}

Total no. of lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/Tutorial: 25

Multidisciplinary Course

Course Code: UMDZOT203

Course Title: Applied Zoology

Credits: 03

Total no. of lectures: Theory: 45 hours

Maximum Marks: 75

Theory: 75

Skill Enhancement Course

Course Code: USEZOT211

Course Title: Essential of Medical Parasitology

Credits: 03

Total no. of lectures: Theory/Practical: 75 hours

(15 hours)/(60 hours)

Maximum Marks: 75

University of Jammu

Syllabi of Zoology for FYUGP under CBCS as per NEP-2020

SEMESTER-III

(Examination to be held in December 2026,2027,2028)

Major Course

Course Code: UMJZOT301

Course Title: Evolutionary Biology

Credits: 04{03(Theory)+01(Practical)}

Total no.of lectures: Theory:45 hours
Practical:30hours

Maximum Marks: 100

Theory:75

Practical/Tutorial:25

Major Course

Course Code: UMJZOT302

Course Title: Environmental Biology

Credits: 04{03(Theory)+01(Practical)}

Total no. of lectures: Theory:45hours
Practical:30hours

Maximum Marks:100

Theory:75

Practical/Tutorial:25

Minor Course

Course Code: UMIZOT303

Course Title: Ecology and Environment

Credits:04{03(Theory)+01(Practical)}

Total no. of lectures: Theory:45hours
Practical: 30hours

Maximum Marks: 100

Theory:75

Practical/Tutorial:25

Multidisciplinary Course

Course Code: UMDZOT304

Course Title: Economic Zoology

Credits: 03

Total no. of lectures: Theory: 45hours

Maximum Marks: 75

Theory:75

Skill Enhancement Course

Course Code: USEZOT311

Course Title: Essential Medical Genetics

Credits: 03

Total no. of lectures:

Theory/Practical: 75hours

(15 hours)/(60 hours)

Maximum Marks: 75

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS
PER NEP - 2020
(For the Examination to be held in Year Dec- 2025, 2026 & 2027)
(MAJOR COURSE)
UG SEMESTER-I

MAJOR CORE COURSE NO.	:	UMJZOT101
MAJOR CORE COURSE TITLE	:	BIOMOLECULES AND PHYSIOLOGY OF LIFE SUSTAINING SYSTEMS
CREDITS	:	04 {03 (Theory) +1 (Practical)}
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM :		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The course provides an introduction to the structure of biomolecules and covers basic aspects of life sustaining processes. After successfully completing this course, the students will be able to understand about the importance and scope of biochemistry; to understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids; to learn biochemical tests for amino acids, carbohydrates, proteins and nucleic acids.

UNIT I: Structure and Function of Biomolecules (13 Hrs.)

- 1.1 Classification, Structure and Biological importance of Carbohydrates (Monosaccharides, Disaccharides, Polysaccharides)
- 1.2 General Structure, Properties and Functions of Amino acids; Essential and Non-Essential Amino acids
- 1.3 General characters, classification and Role of Proteins
- 1.4 Definition, Classification and Functions of Lipids
- 1.5 Fatty acids: Saturated and Unsaturated
- 1.6 Enzymes: Properties and Classification; Mechanism of Enzyme Action

UNIT 2: Physiology of Digestion (10 Hrs.)

- 2.1 Food and its components: Vitamins, Minerals, Water
- 2.2 Digestion
 - 2.2.1 Intracellular and Extracellular Digestion
 - 2.2.2 Mechanical Digestion of Food
 - 2.2.3 Chemical digestion of Food
- 2.3 Absorption
 - 2.3.1 Active and Passive Absorption (Concept)
 - 2.3.2 Carbohydrates
 - 2.3.3 Lipids
 - 2.3.4 Proteins

UNIT 3: Respiration in Humans (10 Hrs.)

- 3.1 Aerobic and Anaerobic Respiration
- 3.2 External and Internal Respiration

(10 Hrs.)

- 3.3 Mechanics of Pulmonary Ventilation
3.4 Respiratory Volumes and Capacities
3.5 Mechanism of Gaseous Exchange across Alveoli
3.6 Mechanism of Transport of Oxygen and Carbon dioxide in blood
3.7 Control of Respiration

UNIT 4: Blood, Human Heart and Renal Physiology**(12 Hrs.)**

- 4.1 Blood: Components and Functions
4.2 Blood Groups: ABO, MN & Rh - factor
4.3 Coagulation of Blood
4.4 Structure of Human Heart
4.5 Cardiac Cycle and Heart Sounds
4.5 Structure of Kidney and its functional unit (Nephron).
4.6 Urine Formation (Uropoiesis) and Composition of Urine

(30 Hrs.)**Practicum**

1. Qualitative tests to identify functional groups of carbohydrates in given solution (Glucose, Fructose, Sucrose, and Lactose)
2. Simple lab tests for detection of Carbohydrates.
3. Simple lab tests for detection of Proteins.
4. Simple lab tests for detection of Fats.
5. Quantification of protein in a sample by Lowry's method.
6. Histological studies of Mammalian Duodenum, Liver, Pancreas, Lung and Kidney from permanent slides.
7. Study of activity of salivary amylase under optimum conditions.
8. Examination of Human Blood groups.
9. To prepare Haemin crystals using Human blood.
10. Prepare and examine blood smear to study Erythrocytes and Leucocytes.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final Examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Nelson, D.L. & Cox, M.M. (2017). Lehninger Principles of Biochemistry (7th edition) Worth.
2. Berg, J.M.; Tymoczko, J.L. and Stryer, L. (2012). Biochemistry (7th edition) Freeman.
3. Zubay, G. (2017). Biochemistry (4th edition) McGraw-Hill.
4. Balwan, W.K & Saba N (2018). The DBS Handbook of Biochemistry.
5. Conn, E.E.; Stumpf, P.K.; Bruening, G. and Doi, R.H. (2006) Principles of Biochemistry (5th edition) Wiley.
6. Singh H.R. Animal Physiology and Biochemistry.
7. Vander, A.; Sherman, J. and Luciano, D.(2003) Human Physiology (9th edition).
8. Guyton, A.C. *et al.* (2008) Textbook of Medical Physiology (12th edition) W.B. Saunders Co.
9. Wahied K. B. (2017). Animal Physiology and Biochemistry, Paradise press, New Delhi.
10. Withers, P.C. *et al.* (1992) Comparative Animal Physiology (1st edition) Brooks Cole.
11. Tortora G.J and Derrickson B.H (2009) Principles of Anatomy and Physiology (XII Edition), John Wiley & Sons, Inc.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS PER
NEP - 2020
(For the Examination to be held in Year Dec- 2025, 2026 & 2027)
(MINOR COURSE)
UG SEMESTER-I

MINOR CORE COURSE NO.	:	UMIZOT102
MINOR CORE COURSE TITLE	:	BASICS OF BIOCHEMISTRY & PHYSIOLOGY-I
CREDITS	:	04 {03 (Theory) + 01(Practicals)}
MAXIMUM MARKS THEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM	:	03
Hours MAXIMUM MARKS PRACTICALS	:	25
I) Continuous assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The course provides an introduction to the structure of biomolecules and covers basic aspects of life sustaining processes. After successfully completing this course, the students will be able to understand about the importance and scope of biochemistry; to understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids; to learn biochemical tests for amino acids, carbohydrates, proteins and nucleic acids.

UNIT I: Structure and Function of Biomolecules

(13 Hrs.)

- 1.1 Classification, Structure and Biological importance of Carbohydrates (Monosaccharides, Disaccharides, Polysaccharides)
- 1.2 General Structure, Properties and Functions of Amino acids; Essential and Non-Essential Amino acids
- 1.3 General characters, classification and Role of Proteins
- 1.4 Definition, Classification and Functions of Lipids
- 1.5 Fatty acids: Saturated and Unsaturated
- 1.6 Enzymes: Properties and Classification; Mechanism of Enzyme Action

UNIT 2: Physiology of Digestion

(10 Hrs.)

- 2.1 Food and its components: Vitamins, Minerals, Water
- 2.2 Digestion
 - 2.2.1 Intracellular and Extracellular Digestion
 - 2.2.2 Mechanical Digestion of Food
 - 2.2.3 Chemical digestion of Food
- 2.3 Absorption
 - 2.3.1 Active and Passive Absorption (Concept)
 - 2.3.2 Carbohydrates
 - 2.3.3 Lipids
 - 2.3.4 Proteins

UNIT-3: : Respiration in Humans

(10Hrs.)

- 3.1 Aerobic and Anaerobic Respiration
- 3.2 External and Internal Respiration
- 3.3 Mechanics of Pulmonary Ventilation
- 3.4 Respiratory Volumes and Capacities
- 3.5 Mechanism of Gaseous Exchange across Alveoli
- 3.6 Mechanism of Transport of Oxygen and Carbondioxide in blood
- 3.7 Control of Respiration

UNIT 4: Blood, Human Heart and Renal Physiology

(12Hrs.)

- 4.1 Blood: Components and functions
- 4.2 Blood Groups: ABO, MN & Rh-factor
- 4.3 Coagulation of Blood
- 4.4 Structure of Human Heart
- 4.5 Cardiac Cycle and Heart Sounds
- 4.6 Structure of Kidney and its functional unit (Nephron).
- 4.7 Urine Formation (Uropoiesis) and Composition of Urine

Practicum(30Hrs.)

1. Qualitative test to identify functional groups of carbohydrates in given solution (Glucose, Fructose, Sucrose, and Lactose)
2. Simple lab tests for detection of Carbohydrates.
3. Simple lab tests for detection of Proteins.
4. Simple lab tests for detection of Fats.
5. Quantification of protein in a sample by Lowry's method.
6. Histological studies of Mammalian Duodenum, Liver, Pancreas, Lungs and Kidney from permanent slides.
7. Study of activity of salivary amylase under optimum conditions.
8. Examination of Human Blood groups.
9. To prepare Haemin crystals using Human blood.
10. Prepare and examine blood smear to study Erythrocytes and Leucocytes.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Minutes	15
External Theory End Semester	100%	3Hrs.	60

Continuous assessment	-	-	10 (Based on Daily Performance only)
Final Examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Totalmarks60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each questionshallbeof12 marks.

Internal Assessment {Total marks15}

Fifteen(15) marksfortheorypaperinasubjectreservedforinternalassessmentsshallhaveonealong answer type question of7 marks and four short answer type questions of 2markseach.

Recommended Readings

1. Nelson,D.L.&Cox,M.M. (2017). Lehninger PrinciplesofBiochemistry(7thedition)Worth.
2. Berg,J.M.; Tymoczko,J.L. andStryer,L. (2012).Biochemistry (7thedition) Freeman.
3. Zubay,G. (2017). Biochemistry (4thedition)McGraw-Hill.
4. Balwan,W.K and SabaN(2018).DBS Handbook of Biochemistry.DBS Imprints,NewDelhi.
5. Conn, E.E.; Stumpf, P.K.; Bruening,G. and Doi,R.H.(2006) Principles of Biochemistry (5thedition)Wiley.
6. Singh H.R. Animal Physiology and Biochemistry.
7. Vander,A.;Sherman,J.andLuciano,D.(2003)HumanPhysiology(9thedition).
8. Guyton, A.C. *etal.* (2008) Textbook of Medical Physiology(12thedition) W.B.Saunders Co.
9. Wahied K. B.(2017).Animal Physiology and Biochemistry, Paradise press,NewDelhi.
10. Murray,R.K.,GrannerD.K.,Mayes,P.A.,RodwellV.W.(2009).Harper'sIllustratedBiochemistr y (XXVIIIEdition)Large MedicalBooks/Mc-Grawhill
11. Withers, P.C. *etal.* (1992) Comparative Animal Physiology(1stedition)BrooksCole.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS
PER NEP-2020

(For the Examination to be held in Year Dec-2025, 2026 & 2027)

(MULTIDISCIPLINARY COURSE)

UG SEMESTER-I

MULTIDISCIPLINARY COURSE NO.	:	UMDZOT103
MULTIDISCIPLINARY COURSE TITLE	:	APPLIED ZOOLOGY
CREDITS	:	03
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
TIME DURATION	:	03 Hours

Objectives and Expected Learning Outcomes

To acquaint the students with basic understanding of the Epidemiology, Economic Zoology & Parasitology. Upon successful completion of this course, the students should be able to have some knowledge of epidemiology of common infectious diseases, management of poultry & Cattle breeds and about their immunity.

Unit 1: Epidemiology

(12Hrs.)

- 1.1 Epidemiology: Definition, Scope, Applications and Domains.
- 1.2 Communicable Diseases: Cause, Symptoms, and Treatment of:
 - 1.2.1 Tuberculosis
 - 1.2.2 AIDS
 - 1.2.3 Covid-19
- 1.3 Non-communicable Diseases: Cause, Symptoms and Treatment of:
 - 1.3.1 Hypertension
 - 1.3.2 Cancer
 - 1.3.3 Diabetes

Unit 2: Economic Zoology

(13Hrs.)

- 2.1 Apiculture
 - 2.1.1 Apiculture: Definition, Scope and Advantages
 - 2.1.2 Products of Apiculture: Honey, Bee Wax and Bee Venom.
 - 2.1.3 Life Cycle of Honeybee: Concept
- 2.2 Sericulture
 - 2.2.1 Sericulture; Definition, Status and Scope
 - 2.2.2 Life cycle of Silkworm: Brief
 - 2.2.3 Silk: Types, Properties & Uses

Unit3: Dairy and Poultry Farming

(10Hrs.)

- 3.1 Dairy Farming: Definition and Scope
- 3.2 Cattle Breeds: Characters of Red Sindhi, Sahiwal & Jersey
- 3.3 Introduction to Poultry farming
- 3.4 Poultry Breeds: Characters of Rhode Island Red, White Leghorn & Black Minorca

Unit4: Parasitology

(10Hrs.)

- 4.1 Immunity: Definition & its types.
- 4.2 Symbiotic Relationships: Mutualism, Commensalism
- 4.3 Parasite, Vectors and Hosts
 - 4.3.1 Parasites: Definition and Types
 - 4.3.2 Vectors: Definition and Types
 - 4.3.3 Vector borne Diseases: Dengue and Malaria
 - 4.3.4 Host: Definition and Types

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be Covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Minutes	15
External Theory End Semester	100%	3Hrs	60

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A: Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Book of Bee Keeping by Sharma P.L. and Singh, S.H.
2. Prospective in Indian Apiculture by R.C. Mishra.
3. Rearing queen bees in India by M.C. Suryanarayana et al.
4. Bee Keeping in India by G.K. Ghosh.
5. Poultry by Banerjee, GC (1982), Oxford and IBM Publication
6. The DBS Handbook of Poultry Management by W.K. Balwan and A.K. Verma.
7. Economic Zoology by Shukla and Upadhyay.
8. Education of Communicable and Non-Communicable Diseases S.L. Goel Published by Deep & Deep Publications Pvt. Ltd., 2009
9. Applied Zoology by W.K. Balwan and N. Saba, Malhotra Publisher.
10. Clinical Veterinary Microbiology by W.K. Balwan, Pinakin Publishing, New Delhi.
11. Entomology and Pest Management by Pedigo L.P. Prentice Hall Publication

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY
For the Examination to be held in Year 2025, 2026 & 2027
(SKILL ENHANCEMENT COURSE)
UG SEMESTER-I
UNDER NEP-2020

SKILL ENHANCEMENT COURSE NO.	:	USEZOT111
SKILL ENHANCEMENT COURSE TITLE	:	BASICS IN CLINICAL BIOCHEMISTRY
CREDIT	:	03
MAXIMUM MARKS	:	75
Mid-Term Examination (Part-1)	:	25
Final Examination (Part-2)	:	50
DURATION OF UNIVERSITY EXAM	:	03 Hours

Objectives and Expected Learning Outcomes

To acquaint the students with basic understanding of the biological techniques, clinical pathology and practical biochemistry. The course also gives an account of the health and disease surveillance, health interventions, and implementation of disease prevention strategies. After completing this course the learners will be able to increase their skill, attitudes and knowledge towards causes of diseases and understand about the importance and scope of biochemistry.

UNIT-I: Fundamentals of Biological Techniques (7 Hrs.)

- 1.1 Microscopy: Principle & Types (Simple, Compound, Phase contrast)
- 1.2 Ultracentrifugation: Principle & Types
- 1.3 Spectrophotometry: Principle & Types
- 1.4 Electrophoresis: Principle & Types (Agarose Gel Electrophoresis & Polyacrylamide Gel Electrophoresis)

UNIT-II: Basic Clinical Pathology (8 Hrs.)

- 2.1 Clinical Pathology: Definition and Scope
- 2.2 Common Metabolic Disorders: Diabetes, Hypertension, Obesity
- 2.3 Importance of CSF Examination
- 2.4 Physiology of Blood
 - 2.4.1 Clotting Factors
 - 2.4.2 Haemostasis

Practicum (60 Hrs.)

- 1. Recording of Blood Glucose level by using Glucometer.

FYUGP (SEMESTER-I) 2025-2027
TITLE- BASICS IN CLINICAL BIOCHEMISTRY
COURSE CODE- USEZOT111

2. Recording of Blood Pressure and Pulse rate.
3. Differential staining of Human blood corpuscles using Leishman stain.
4. To perform counting of WBC in blood using Hemocytometer.
5. To perform counting of RBC in blood using Hemocytometer.
6. To determine the bleeding time of given subject by Duke's Method.
7. To determine the clotting time of given subject by Wright's Method.
8. To determine the ABO blood group and Rh factor of an individual.
9. Procedure for Blood Sample Collection and Preservation
10. Calculate the Solution/Strengths of Chemicals: Percentage, Normality, Molarity, Molality, Osmolarity, ppm, ppb.
11. Study of simple Renal Function Test.
12. Study of simple Liver Function Test.
13. Study of common procedure for Urine Examination.

NOTE FOR CONDUCTING EXAMINATION IN USEZOT111 & PAPER SETTERS

Note for paper setter for Mid Term Examination: Part-1

The question paper will be of 25 marks. There shall be 2 Sections in the question paper with pattern as follows:

Section-A shall comprise of 4 short answer type questions of (2½marks each) covering all three units with atleast one question from each unit. The students have to attempt all the 4 questions from Section-A.

Section-B shall comprise of a total of 6 questions with two questions selected from each unit. Each question shall be of 5 marks. The students have to attempt 3 questions selecting only one question from each unit.

EVALUATION OF SKILLS:

Final Examination Part-2

The Evaluation of Skills will be internal. The Examination of Skills shall be of 50 marks. The evaluation of skills will be done internally through the Board of three Members (including the trainer of the Course).

SUGGESTED READINGS

1. Clinical Biochemistry: Metabolic and Clinical Aspects by William J Marshall, Marta Lapsley, Andrew P Day and Ruth M Ayling Churchill Livingstone Elsevier, 3rd ed.
2. Text book of Clinical Biochemistry by Ramnik Sood, CBS Publishers and Distributers PvtLtd, India.
3. Textbook of biochemistry with clinical correlations Edition: 5th BY Devlin, Thomas M.
4. A DBS Handbook of Biochemistry by W.K.Balwan, DBS Imprints New Delhi.
5. Clinical Biochemistry by Michael Murphy, R. Srivastava and Kevin Deans, ElsevierPublishers.
6. Text book of Clinical Biochemistry by S.S. Haque.
7. Text Book of Biochemistry by Dr. Prasad R. Manjeshwar.
8. Practical Clinical Biochemistry by Rajni Chawla
9. Physiology & Biochemistry by W.K.Balwan and N Saba, Paradise Press, New Delhi.
10. Textbook of medical biochemistry Edition: 7th BY Chatterjea, M N , Shinde, Rana.
11. Varley's practical clinical biochemistry Edition 6th by Gowenlock, Alan H.
12. Harper's illustrated biochemistry Edition 31th by Murray, Robert K.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS
PER NEP - 2020
(For the Examination to be held in Year May- 2026, 2027 & 2028)
(MAJOR COURSE)
UG SEMESTER-II

MAJOR CORE COURSE NO.	:	UMJZOT201
MAJOR CORE COURSE TITLE	:	BASICS IN CELL BIOLOGY
CREDITS	:	04{03 (Theory) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous assessment	:	10
II) Final examination	:	15

Objectives and Expected Learning Outcomes

The course provides a detailed insight into basic concepts of cellular structure and function. It also gives an account of the complex regulatory mechanisms that control cell function. Student at the completion of course will be able to understand the functioning of cell and its organelles and the intricate cellular mechanisms involved; to understand the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form a new organism.

UNIT I: Cell as Basic Unit of Life (12 Hrs.)

- 1.1 Cell: Discovery, Shape, Size and Number; Cell Theory
- 1.2 Cell Types: Prokaryotic and Eukaryotic (Characteristics)
- 1.3 Eukaryotic Cell: Ultrastructure of Eukaryotic cell (Animal cell)
- 1.4 Prokaryotic Cell: Ultrastructure of Prokaryotic cell (Bacteria)
- 1.5 Plasma Membrane: Chemical composition and Structure (Fluid Mosaic Model)
- 1.6 Functions of Plasma Membrane
- 1.7 Cell Wall

UNIT 2: Intracellular Compartments (13 Hrs.)

- 2.1 Structure, Chemical composition and Functions of following:
 - 2.1.1 Mitochondria
 - 2.1.2 Endoplasmic Reticulum
 - 2.1.3 Golgi apparatus
 - 2.1.4 Ribosomes
 - 2.1.5 Centrioles
 - 2.1.6 Lysosomes
 - 2.1.7 Cilia and Flagella
- 2.2 Nucleus and Nucleolus
 - 2.2.1 Nucleus: Structure and Function

2.2.2 Nucleolus: Structure and Function

UNIT 3: Organization of Chromosomes (10 Hrs.)

- 3.1 Chromatin: Introduction; Heterochromatin and Euchromatin
- 3.2 Eukaryotic Chromosome
 - 3.2.1 Composition and Morphology
- 3.3 Ultrastructure of Eukaryotic Chromosome
 - 3.3.1 Nucleosome model
 - 3.3.2 Solenoid model
- 3.4 Giant Chromosome: Polytene and Lampbrush Chromosomes

UNIT 4: Cell division and Cell Cycle (10 Hrs.)

- 4.1 Cell Cycle: Definition and Phases of Cell cycle
- 4.2 Cell Division
 - 4.2.1 Mitosis and its significance
 - 4.2.2 Meiosis and its significance
 - 4.2.3 Synaptonemal Complex: Structure and Functions
 - 4.2.4 Comparison between Mitosis and Meiosis

Practicum (30 Hrs.)

1. Study of Principle and Working of Compound Microscope.
2. Study of Prokaryotic Cell with the help of Model/Chart/Photomicrograph.
3. Study of Eukaryotic Cell with the help of Model/Chart/Photomicrograph.
4. Study of Mitochondria with the help of Model/Chart/Photomicrograph.
5. Study of Golgi apparatus with the help of Model/Chart/Photomicrograph.
6. Study of Nucleus with the help of Model/Chart/Photomicrograph.
7. Study of Mitosis with the help of Permanent slide/ Model/Chart/Photomicrograph
8. Study of Meiosis with the help of Permanent slide/ Model/Chart/Photomicrograph.
9. To make temporary slides of Mitotic division in Onion Root Tip.
10. To make a temporary mount of *Lactobacillus* with Gram Staining.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15



External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Cell Biology by C.B. Powar.
2. Fundamental concepts of Cell Biology by K.G. Purohit
3. Cell Biology and Molecular Biology by P.C. Vasishta and P.S. Gill
4. Animal Cytology and Evolution by M.J.D. White.
5. Cytogenetics by N Saba and W K Balwan, Random Publications, New Delhi.
6. Cell Biology and Genetics by PK Gupta.
7. Molecular Cell Biology by W.K. Balwan and N. Saba, Alfa Publications, New Delhi.
8. Cell and Molecular Biology by De Robertis E.D.P.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS
PER NEP - 2020
(For the Examination to be held in Year May- 2026, 2027 & 2028)
(MINOR COURSE)
UG SEMESTER-II

MINOR CORE COURSE NO.	:	UMIZOT202
MINOR CORE COURSE TITLE	:	CYTOLOGY
CREDITS	:	04 {03 (Theory) + 01 (Practical)}
MAXIMUM MARKS	:	75
i) External (University Exam)	:	60
ii) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKSPRACTICALS	:	25
i) Continuous assessment	:	10
ii) Final examination	:	15

Objectives and Expected Learning Outcomes

The course provides a detailed insight into basic concepts of cellular structure and function. It also gives an account of the complex regulatory mechanisms that control cell function. Student at the completion of course will be able to understand the functioning of cell and its organelles and the intricate cellular mechanisms involved; to understand the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form a new organism.

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- 2.1 Structure, Chemical composition and Functions of following:
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 - 2.1.3 Golgi apparatus
 - 2.1.4 Ribosomes
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 - 2.1.6 Lysosomes
 - 2.1.7 Cilia and Flagella
- 2.2 Nucleus and Nucleolus
 - 2.2.1 Nucleus: Structure and Function



2.2.2 Nucleolus: Structure and Function

UNIT 3: Organization of Chromosomes (10 Hrs.)

- 3.1 Chromatin: Introduction; Heterochromatin and Euchromatin
- 3.2 Eukaryotic Chromosome
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- 3.3 Ultrastructure of Eukaryotic Chromosome
 - 3.3.1 Nucleosome model
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 - 4.2.1 Mitosis and its significance
 - 4.2.2 Meiosis and its significance
 - 4.2.3 Synaptonemal Complex: Structure and Functions
 - 4.2.4 Comparison between Mitosis and Meiosis

Practicum (30 Hrs.)

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2. Study of Prokaryotic Cell with the help of Model/Chart/Photomicrograph.
3. Study of Eukaryotic Cell with the help of Model/Chart/Photomicrograph.
4. Study of Mitochondria with the help of Model/Chart/Photomicrograph.
5. Study of Golgi apparatus with the help of Model/Chart/Photomicrograph.
6. Study of Nucleus with the help of Model/Chart/Photomicrograph.
7. Study of Mitosis with the help of Permanent slide/ Model/Chart/Photomicrograph
8. Study of Meiosis with the help of Permanent slide/ Model/Chart/Photomicrograph.
9. To make temporary slides of Mitotic division in Onion Root Tip.
10. To make a temporary mount of *Lactobacillus* with Gram Staining.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

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External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Fundamental concepts of Cell Biology by K.G.Purohit
2. Cell Biology and Molecular Biology by P.C.Vasishta and P.S.Gill.
3. Animal Cytology and Evolution by M.J.D.White
4. Cytogenetics by N Saba and W K Balwan, Random Publications, New Delhi 5.
5. Cell Biology and Genetics by P K Gupta
6. Cell and Molecular Biology by De Robertis E.D.P.
7. Cell Biology by V.B. Rastogi
8. Molecular Cell Biology by W K. Balwan and N. Saba, Alpha Publications, New Delhi.
9. Cell biology by C.B. Powar.



UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY UNDER CBCS AS
PER NEP - 2020

(For the Examination to be held in Year May- 2026, 2027 & 2028)

(MULTIDISCIPLINARY COURSE)

UG SEMESTER-II

MULTIDISCIPLINARY COURSE NO. :	UMDZOT203
MULTIDISCIPLINARY COURSE TITLE :	APPLIED ZOOLOGY
CREDITS :	03
MAXIMUM MARKS :	75
I) External (University Exam) :	60
II) Internal Assessment :	15
TIME DURATION :	03 Hours

Objectives and Expected Learning Outcomes

To acquaint the students with basic understanding of the Epidemiology, Economic Zoology & Parasitology. Upon successful completion of this course, the student should be able to have some knowledge of epidemiology of common infectious diseases, management of poultry & Cattle breeds and about the immunity:

Unit 1: Epidemiology

(12 Hrs.)

- 1.1 Epidemiology: Definition, Scope, Applications and Domains.
- 1.2 Communicable Diseases: Cause, Symptoms, and Treatment of:
 - 1.2.1 Tuberculosis
 - 1.2.2 AIDS
 - 1.2.3 Covid-19
- 1.3 Non-communicable Diseases: Cause, Symptoms and Treatment of:
 - 1.3.1 Hypertension
 - 1.3.2 Cancer
 - 1.3.3 Diabetes

Unit 2: Economic Zoology

(13 Hrs.)

- 2.1 Apiculture
 - 2.1.1 Apiculture: Definition, Scope and Advantages
 - 2.1.2 Products of Apiculture: Honey, Bee Wax and Bee Venom.
 - 2.1.3 Life Cycle of Honey bee: Concept
- 2.2 Sericulture
 - 2.2.1 Sericulture; Definition, Status and Scope
 - 2.2.2 Life cycle of Silkworm: Brief
 - 2.2.3 Silk: Types, Properties & Uses

Unit 3: Dairy and Poultry Farming

(10 Hrs.)

- 3.1 Dairy Farming: Definition and Scope
- 3.2 Cattle Breeds: Characters of Red Sindhi, Sahiwal & Jersey
- 3.3 Introduction to Poultry farming
- 3.4 Poultry Breeds: Characters of Rhode Island Red, White Leghorn & Black Minorca

Unit 4: Parasitology

(10 Hrs.)

- 4.1 Immunity: Definition & its types.
- 4.2 Symbiotic Relationships: Mutualism, Commensalism
- 4.3 Parasite, Vectors and Hosts
 - 4.3.1 Parasites: Definition and Types
 - 4.3.2 Vectors: Definition and Types
 - 4.3.3 Vector borne Diseases: Dengue and Malaria
 - 4.3.4 Host: Definition and Types

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Book of Bee Keeping by Sharma P.L. and Singh, S.H.
2. Prospective in Indian Apiculture by R.C. Mishra.
3. Rearing queen bees in India by M.C. Suryanarayana et. al.
4. Bee Keeping in India by G. K. Ghosh.
5. Poultry by Banerjee, G C (1982), Oxford and IBM Publication
6. The DBS Handbook of Poultry Management by W.K. Balwan and A.K.Verma.
7. Economic Zoology by Shukla and Upadhyay.
8. Education of Communicable and Non-Communicable Diseases S.L. Goel Published by Deep & Deep Publications Pvt. Ltd., 2009
9. Applied Zoology by W.K.Balwan and N. Saba, Malhotra Publisher.
10. Clinical Veterinary Microbiology by W.K.Balwan, Pinakin Publishing, New Delhi.
11. Entomology and Pest Management by Pedigo L P. Prentice Hall Publication

FYUGP (SEMESTER-II) 2025-2028
TITLE- ESSENTIALS OF MEDICAL PARASITOLOGY
COURSE CODE- USEZOT211

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN ZOOLOGY
For the Examination to be held in Year 2026, 2027 & 2028
(SKILL ENHANCEMENT COURSE)
UG SEMESTER-II
UNDER NEP-2020

SKILL ENHANCEMENT COURSE NO.	:	USEZOT211
SKILL ENHANCEMENT COURSE TITLE	:	ESSENTIALS OF MEDICAL PARASITOLOGY
CREDITS	:	03
MAXIMUM MARKS	:	75
Mid-Term Examination (Part-1)	:	25
Final Examination (Part-2)	:	50
DURATION OF UNIVERSITY EXAM	:	03Hours

Objectives and Expected Learning Outcomes

To introduce general parasitology and impart advanced knowledge on parasitological research methods. After completing this course the learners will be able to develop and implement public health interventions, to engage with health systems and public health initiatives and to increase their skill, attitudes and knowledge towards causes of diseases.

UNIT-I: General Parasitology **(7 Hrs)**

- 1.1 Parasitology: Definition, History, Scope
- 1.2 Parasitism and Parasitoids
- 1.3 Status of Parasitic Diseases in India with special reference to Jammu & Kashmir
- 1.4 Emerging and Re-emerging Diseases: Covid-19, Dengue, Enteric Fever

UNIT-II: Public Health Concerns **(8 Hrs)**

- 2.1 Public Health: Definition, Scope & Functions
- 2.2 Dimensions & Determinants of Health
- 2.3 Public Health Problems and Issues
- 2.4 Health Programs in India (AIDS, Leprosy, Tuberculosis, Malaria, Kala-Azar, Filariasis)
- 2.5 Antibiotic Resistance

Practicum **(60 Hrs)**

1. Study of sampling Techniques of Blood, Stool, Urine, Sputum and Swabs.
2. Study of Parasites through Permanent Prepared Slide/Charts: *Plasmodium*, *Entamoeba*, *Leishmania*, *Schistosoma*, *Ascaris*, *Enterobius*, *Fasciola*, *Taenia solium*, *Echinococcus*, *Trypanosoma* or any other available parasite.



FYUGP (SEMESTER-II) 2025-2028
TITLE- ESSENTIALS OF MEDICAL PARASITOLOGY
COURSE CODE- USEZOT211

3. Study of Ectoparasites of medical importance.
4. Study of Control Measures of Parasitic Diseases.
5. Field survey on Common communicable diseases of respective areas.
6. Field survey on status of important vectors and reservoirs.
7. General methods of microscopic preparations (killing, fixing, washing, dehydration, staining, destaining, mounting) of any vertebrate parasite available.
8. Laboratory diagnosis of Parasitism: Sample Collection and Examination.

NOTE FOR CONDUCTING EXAMINATION IN USEZOT211 & PAPER SETTERS

Note for paper setter for Mid Term Examination: Part-1

The question paper will be of 25 marks. There shall be 2 Sections in the question paper with pattern as follows:

Section-A shall comprise of 4 short answer type questions of (2½marks each) covering all three units with atleast one question from each unit. The students have to attempt all the 4 questions from Section-A.

Section-B shall comprise of a total of 6 questions with two questions selected from each unit. Each question shall be of 5 marks. The students have to attempt 3 questions selecting only one question from each unit.

EVALUATION OF SKILLS:

Final Examination Part-2

The Evaluation of Skills will be internal. The Examination of Skills shall be of 50 marks. The evaluation of skills will be done internally through the Board of three Members (including the trainer of the Course).

SUGGESTED READINGS

1. Diagnostic Medical Parasitology by Lynne Shore Garcia, ASM Press, Washington, DC.
2. Medical Parasitology by C P Baveja and V Baveja, Arya Publishing Company.
3. Parasitology (Protozoology & Helminthology) by K.D Chatterjee, Chatterjee Medical Publishers.
4. Medical Parasitology by D. R. Arora and Brij Bala Arora.
5. Medical Parasitology, A Text book by Rohela Mahmud, Yvonne Ai Lian Lim and Amiraj Amir, Springer Publishers.
6. Applied Zoology by W.K. Balwan and Ashok K. Verma, MB Publishers, Jammu JK India.
7. Medical Parasitology by K. Shyamasundari and K.Hanumantha Rao, MJP Publishers ,Chennai.
8. Medical Microbiology and Parasitology By B.S. Nagoba and Asha Pichare, Elsevier.
9. Parasitology: An Integrated Approach by Alan Gunn and Sarah J. Pitt, Wiley-Blackwell, A John Wiley & sons, Ltd. Publication.
10. Introduction to Animal Parasitology, 3rd Edition by J.D.Smyth, Cambridge University Press, 1994.
11. Clinical Biochemistry, Medical Parasitology and Clinical Genetics by W.K,Balwan and N. Saba, Malhotra brothers and publishers, Jammu JK.
12. Introduction to Parasitology, A.C,Chandler and C.O. Read, John Wiley & Sons Inspiration, USA.

